

NON-PUBLIC?: N
ACCESSION #: 9506200116
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Kewaunee Nuclear Power Plant PAGE: 1 OF 7

DOCKET NUMBER: 05000305

TITLE: Failure to Adequately Assess the Consequences During the
Recovery from switch misposition Results in
Turbine/Reactor trip
EVENT DATE: 5/16/95 LER #: 95-003-00 REPORT DATE: 6/14/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 5%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Jay D. Dressen - STA TELEPHONE: (414) 388-2560
x2233
COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On May 16, 1995 with the reactor at approximately 5 percent power, Surveillance Procedure (SP) 54-064, "Turbine Overspeed Trip Test," was being performed. SP 54-064 is required once per operating cycle and was being performed in preparation for plant startup after the 1995 Refueling Outage. During the performance of the procedure, the Nuclear Control Operator (NCO) mispositioned the Overspeed Protection Control (OPC) key switch, which caused the turbine control valves to close. When the NCO and operations personnel attempted to recover from the mispositioning event, the reactor tripped due to steam flow greater than feedwater flow coincident with steam generator low level in the B train steam generator.

The cause of this event was determined to be the failure to adequately assess the consequences of returning the OPC key switch to the "OFF" position. It was determined that the lack of self checking when

manipulating the OPC key switch and a heightened sense of urgency to regain and control turbine speed after the misposition of the OPC key switch were contributing factors to this event.

The NCO was reminded as to the importance of self checking. An evaluation will be performed to determine the need to change the OPC key switch labels to reduce the probability of reoccurrence of this event. SP 54-064 is being revised to give generic guidance to address unusual circumstances encountered during the performance of the SP. Additional training will be provided during the next Operations Training Requalification cycle on the turbine control system.

END OF ABSTRACT

TEXT PAGE 2 OF 7

DESCRIPTION OF EVENT

This report describes an unplanned reactor RCT! trip that occurred at 1135 on May 16, 1995. On May 16, with the reactor at approximately five percent power, Surveillance Procedure (SP) 54-064, "Turbine Overspeed Trip Test," was being performed following the 1995 refueling outage.

The turbine TRB! overspeed protection controller (OPC) SCO! is tested as part of SP 54-064. The OPC is designed to close the turbine control valves FCV!, the turbine interceptor valve ISV!, and the Feedwater (FW) heater 14 A and B and 15 A and B train non-return valves ISV! when the turbine speed reaches 103 percent of rated turbine speed. When turbine speed decreases to 102 percent of rated turbine speed the turbine control valves, turbine interceptor valves, and the FW heater 14 A and B and 15 A and B train non-return valves reopen until the OPC setpoint of 103 percent of rated speed is achieved. The turbine OPC can be blocked by positioning the OPC key switch HS! to the "Overspeed Test" position.

The OPC key switch has three positions, "Test," "Off," and "Overspeed Test." Placing the key switch in the "Test" position, allows the OPC function to be tested when the turbine generator TG! is not connected to the grid. When the OPC key switch is in the "Overspeed Test" position the mechanical overspeed trip mechanism SC!, electro-hydraulic control trip SC!, and the redundant overspeed trip system SC! can be tested. The OPC key switch is in the "Off" position during normal plant operation.

TEXT PAGE 3 OF 7

During the performance of SP 54-064, on May 16, the OPC circuitry had

been successfully tested. The next part of the procedure tests the mechanical overspeed trip mechanism at 111 percent of rated turbine speed, electro-hydraulic control trip at 111.5 percent of rated turbine speed, and the redundant overspeed trip system which is also at 111.5 percent of rated turbine speed. To test these trips, the OPC circuitry must be bypassed to allow the turbine to reach the setpoint of the trip being tested. To bypass the OPC, the OPC key switch must be turned to the "Overspeed Test" position. When the NCO was directed by SP 54-054, to performed this step he inadvertently positioned the OPC key switch to the "Test" position instead of the "Overspeed Test" position. Since the turbine generator was not connected to the grid, the turbine control valves, the turbine interceptor valves, and the FW heater 14 A and B and 15 A and B train non-return valves closed causing the turbine to coast down in speed. The NCO noticed he had mispositioned the OPC key switch and communicated this to personnel stationed locally at the turbine pedestal. The misposition event was discussed between the NCO and the Control Room Supervisor. They decided the best way to recover from the mispositioning was to set the manual turbine speed "setter" setpoint to match actual turbine speed and return the OPC key switch to the "Off" position. They believed that this would result in a bumpless transfer from the actual coast down turbine speed to the turbine speed manually set in by the NCO. When the OPC key switch was returned to the "Off" position the turbine control valves, the turbine interceptor valves, and the FW heater 14 A and B and 15 A and B train non-return valves fully opened.

TEXT PAGE 4 OF 7

When the OPC key switch was returned to the "Off" position the turbine control valves and the turbine interceptor valves opened to the "reference" value indicated by the turbine control system. When the turbine control valves and the turbine interceptor valves opened, FW flow FI! lagged the steam flow FI!to both SGs HX! causing a steam flow FW flow mismatch. Due to the steam flow FW flow mismatch the SG water inventory was depleted. SG indicated level decreased below 25 percent in the B SG. With a steam flow FW flow mismatch coincident with SG low level of 25 percent, in the B SG, a reactor trip signal was generated causing the reactor and turbine trip.

After the reactor tripped, integrated emergency operating procedure E-0, "REACTOR TRIP OR SAFETY INJECTION," was implemented. All plant systems responded as designed.

CAUSE OF THE EVENT

The turbine control circuitry controls turbine speed from the "reference"

value when making changes in turbine speed. The "setter" value is the desired setpoint for the "reference" value. When a change is desired the "setter" value is manually changed to the desired value and the "Go" pushbutton is depressed. The rate at which the speed/load is changed from the "reference" to the "setter," can be adjusted. After the "Go" pushbutton is depressed, the turbine control circuitry will automatically control the turbine from the "reference" value to the "setter" value at a rate selected.

TEXT PAGE 5 OF 7

When it was decided to manually match the "setter" speed to the actual turbine speed the NCO decreased the "setter" and depressed the "Go" pushbutton. With the OPC key switch in the "test" position, the turbine control circuitry was making the change, in regards to the "reference" value, the NCO desired without physically changing the position of the turbine control valves and interceptor valves, as designed. The rate at which the "reference" was changing to the "setter" was 50 RPM. The NCO did not change this rate. The OPC key switch was returned to the "Off" position when the "reference" turbine speed value was above 1800 RPM. The actual turbine speed value was approximately 1400 RPM. Due to the mismatch of actual turbine speed and the "reference" value, the turbine control valves and the turbine interceptor valves opened, allowing steam flow from the SGs to increase rapidly.

During normal turbine load or speed changes the turbine is at the "reference" value. The operator will set the desired load or speed on the "setter" and set the rate at which the change will occur. The "Go" pushbutton is then depressed and the change is made in a controlled manner. Due to the unusual circumstances experienced during this event more training will be given during the next operations requalification cycle on the turbine control system.

The failure to adequately assess the consequences of returning the OPC key switch to the off position was determined to be the root cause of this event. Contributing factors to this event were the lack of self checking when manipulating the OPC key switch and a sense of urgency to regain and control turbine speed after the misposition of the OPC key switch.

TEXT PAGE 6 OF 7

ANALYSIS OF THE EVENT

This event is reportable in accordance with 10CFR50.73(a)(2)(iv) as an event that resulted in the actuation of the reactor protection system.

This event was also reported in accordance with 10CFR50.72(b)(2)(ii) at 1506 CDT on May 16, 1995.

The reactor trip occurred due to a steam flow FW flow mismatch coincident with low SG level of 25 percent, in the B SG. Integrated emergency operating procedure E-0, "REACTOR TRIP OR SAFETY INJECTION," was implemented and all plant systems responded as designed. Since all systems functioned as designed and nothing unusual or not understood occurred, this event had no safety significance.

CORRECTIVE ACTIONS

The following actions have been or will be addressed prior to the next performance of SP 54-064, "Turbine Overspeed Trip Test: "

1. The NCO was reminded as to the importance of self checking.
2. An evaluation will be performed for the need to change or color code the OPC key switch labels to reduce the probability of this event reoccurring.

TEXT PAGE 7 OF 7

3. SP 54-064 is being revised to give generic guidance to address unusual circumstances encountered during the performance of this event.
4. Additional training will be provided during the next Operations Training Requalification Cycle on the turbine control system.

ADDITIONAL INFORMATION

Equipment Failures: None

Similar Events: None

ATTACHMENT TO 9506200116 PAGE 1 OF 1

NRC-95-70

WPSC (414) 433-1598 PUBLIC
TELECOPIER (414) 433-5544 SERVICE

WISCONSIN PUBLIC SERVICE CORPORATION

600 North Adams o P.O. Box 19002 o Green Bay, WI 54307-9002

June 14, 1995 10 CFR 50.73

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reportable Occurrence 95-003-00

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 95-003-00 is being submitted.

Sincerely,

M. L. Marchi
Manager - Nuclear Business Group

JDD/jmf

Attach.

cc - INPO Records Center
US NRC Senior Resident Inspector
US NRC, Region III

g:\wpfiles\ler\coverltr.wp

*** END OF DOCUMENT ***
